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00225901

GEOLOGICAL WELLSITE REPORT

FINA OIL AND CHEMICAL COMPANY

Roth #11-7
NE SW Section 7, T7N, R59W
Weld County, Colorado

RECEIVED

AUG 14 1990

COLO. OIL & GAS CONS. COM.

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Consulting Geologist

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SUMMARY

The Fina Oil and Chemical Company #11-7 Roth was spudded on July 26, 1990. A total depth of 6950 feet in the J Sandstone was reached on August 1, 1990.

The #11-7 Roth is the first 40 acre developmental well drilled in Caretaker Field. This well was drilled with the benefit of close stratigraphic and structural control provided by three producing wells (Fina's #1-7A Livengood, #12-7 Livengood and Energy Mineral's #1 Crawford), and a dry hole located 40 acres south of this location (Fina's #14-7).

The #11-7 Roth encountered the elusive Caretaker D Sand bar at a log depth of 6764 (-1859). The D Sand interval was signaled by a well developed "normal", i.e., fast drilling break. Samples recovered from this zone had generally good shows consisting of medium brown stain, spotty to homogeneous bright yellow-green fluorescence and instantaneous streaming yellow-green cuts. Visible porosity was estimated at a maximum of 12%.

Subsequently run geophysical logs confirmed that the #11-7 Roth encountered a well developed hydrocarbon bearing D Sandstone reservoir. Water Saturation calculations yield values in the low 40's to mid 50's. And preliminary examination of sidewall cores was equally encouraging. Bottom hole pressure is down from the estimated virgin pressure of 1800 psi. However, the 1200 psi recorded by the repeat formation tester is definitely acceptable. After all, the #11-7 Roth is flanked by three prolific producers.

Production pipe has been run to total depth in the #11-7 Roth for a D Sandstone completion attempt. Based on the data available so far, the #11-7 is expected to rival the performance of the #12-7 and the #1-7A Livengood.

WELL DATA

OPERATOR: Fina Oil and Chemical Company

WELL NAME: Roth #11-7

LOCATION: 2050' FWL, 2000' FSL
NE SW Section 7, T7N, R59W
Weld County, Colorado

DIRECTIONS TO LOCATION: From New Raymer: West on Hwy 14 to Rd
86. SW to R 105. South 3 miles to
lease road. East 2 miles to compressor
station. North .25 miles, then turn
East into location.

ELEVATION: 4896' GL, 4905' KB

SPUD DATE: 7/26/90

DRILLING COMPLETED: 8/01/90

DRILLING CONTRACTOR: Allison Brothers, Rig #1
TOOLPUSHER: Douane Jackson

HOLE SIZE: 12 1/4" to 312', 7 7/8" to TD

SURFACE CASING: 7 Joints (297') of 24# 8 5/8" Set @
307' KB w/ 300 Sacks Class "G" cement

MUD VENDOR: Drilling Fluid Services
ENGINEER: Eric Bertoch
PROGRAM: Gel-Chem LSND

SAMPLES PROGRAM: 30' intervals from 5900 to 6650
10' and 5' intervals from 6650 to TD


GEOLOGICAL SUPERVISION: Goolsby Brothers & Associates, Inc.
GEOLOGIST: Joe Cardoso

LOGGING COMPANY: Schlumberger
ENGINEER: Jim Martin
PROGRAM: DIL, FDC/CNL, ML

REPEAT FORMATION TEST: D Sandstone (6778.45, 6775)

SIDEWALL CORES: D Sandstone
(6779, 6778, 6772, 6770.5, 6768.5)

TOTAL DEPTH: 6950' Driller, 6950' Logger



BOTTOM HOLE FORMATION: J Sandston

WELL STATUS: Ran production casing f/ D Sandstone
production.

DAILY CHRONOLOGY

| <u>DATE</u> | <u>7 AM DEPTH</u> | <u>ROTATING HOURS, PREVIOUS DAY</u> | <u>REMARKS</u> |
|-------------|-------------------|---|----------------------|
| 7/26/90 | 0 | 0 | Spudded @ 4:30 pm |
| 7/27/90 | 312 | 2 1/2 | |
| 7/28/90 | 3476 | 19 | |
| 7/29/90 | 4845 | 16 1/4 | |
| 7/30/90 | 6170 | 21 1/2 | |
| 7/31/90 | 6778 | 16 1/4 | Reached TD @ 6:00 AM |
| 8/01/90 | 6950 | 16 1/2 | |

BIT RECORD

| <u>#</u> | <u>MAKE</u> | <u>SIZE</u> | <u>TYPE</u> | <u>DEPTH OUT</u> | <u>FOOTAGE</u> | <u>HOURS RUN</u> |
|----------|-------------|-------------|-------------|------------------|----------------|------------------|
| 1A | HTC | 12 1/4 | OSC6A | 312 | 312 | 3 1/2 |
| 1 | REED | 7 7/8 | HP11 | 4469 | 4157 | 31 |
| 2 | STC | 7 7/8 | CS250 | 6746 | 2277 | 39 1/2 * |
| 3 | HTC | 7 7/8 | J33 | 6950 | 204 | 18 3/4 |

* "Diamond bit"

MUD RECORD

| <u>DATE</u> | <u>DEPTH</u> | <u>WT</u> | <u>VIS</u> | <u>WL</u> | <u>PH</u> | <u>CHLOR</u> | <u>SOLIDS %</u> |
|-------------|--------------|-----------|------------|-----------|-----------|--------------|-----------------|
| 7/30/90 | 6595 | 9.1+ | 32 | 8.0 | 10.0 | 500 | 5.8 |
| 7/31/90 | 6778 | 9.4+ | 35 | 8.0 | 9.5 | 500 | 8.0 |
| 8/01/90 | 6950 | 9.4 | 50 | 8.0 | 9.5 | 500 | 8.0 |

DEVIATION SURVEYS

| <u>DEPTH</u> | <u>DRIFT</u> | <u>DEPTH</u> | <u>DRIFT</u> |
|--------------|--------------|--------------|--------------|
| 312 | 1/2° | 5003 | 1 1/4° |
| 1309 | 1/4° | 5502 | 2° |
| 2327 | 1° | 6059 | 3/4° |
| 3352 | 3/4° | 6746 | 3/4° |
| 4469 | 1 1/4° | 6950 | 1 1/4° |

FORMATION TOPS
Measured from a KB elevation of 4905 feet.

| <u>FORMATION</u> | <u>E-LOG TOP</u> | <u>SUBSEA</u> |
|------------------|------------------|---------------|
| Niobrara | 6024 | - 1119 |
| Fort Hays | 6272 | - 1367 |
| Codell | 6324 | - 1419 |
| X Bentonite | 6656 | - 1751 |
| D Sandstone | 6764 | - 1859 |
| J Silt | 6834 | - 1929 |
| J Sandstone | 6850 | - 1945 |

LOG ANALYSIS

D Sandstone

$$F = .62/\phi^{2.15}$$

$$R_w = .10,$$

$$\text{Grain Density} = 2.65 \text{ g/cc}$$

| <u>Depth</u> | <u>Rdil</u> | <u>ϕ_d</u> | <u>Sw%</u> | <u>Remarks</u> |
|--------------|-------------|----------------------------|------------|----------------|
| 6768-70 | 22 | .10 | 63 | Low porosity |
| 6770-72 | 25 MAX | .11 | 53 | Hydrocarbon |
| 6772-74 | 30 | .115 | 46 | Hydrocarbon |
| 6774-76 | 39 | .11 | 42 | Hydrocarbon |
| 6776-78 | 43 MAX | .09 | 50 | Hydrocarbon |
| 6778-80 | 29 | .03 | 100 | Tight |

J Sandstone

$$F = .62/\phi^{2.15}$$

$$R_w = .35,$$

$$\text{Grain Density} = 2.65 \text{ g/cc}$$

| <u>Depth</u> | <u>Rdil</u> | <u>ϕ_d</u> | <u>Sw%</u> | <u>Remarks</u> |
|--------------|-------------|----------------------------|------------|----------------|
| 6862-64 | 45 | .11 | 74 | Wet |
| 6864-66 | 32.5 | .075 | 100 | Tight |

BOREHOLE CUTTINGS ANALYSIS

Samples were lagged and analyzed dry. Initial lag of 65 minutes

Lagged Depth (Depth Caught)

(6720) SH, DK TO V DK GY/ BLK, CARB, SFT, PLTY

(6746) SH, DK TO V DK GY/ BLK, CARB, SFT TO FRM, PLTY,
INOC, SCAT BENTO FLKS

NOTE: TRIP F/ BUTTON BIT AT 6746. DID NOT CIRCULATE OUT.

L.A.T. (6750) SH, GY TO BLK, SFT TO FRM, PLTY TO IRREG, OCC
SLTY... ABNT TRIP JUNK

6748 (6760) SH, V DK GY TO BLK, CARB, SFT TO FRM, PLTY TO IRREG

6753 (6770) SH, INC BLK, CARB, SFT TO FRM, PLTY, TR PYR

6760 (6778) SH, A/A

NOTE: CIRCULATE F/ SAMPLES @ 6778.

THE D SAND INTERVAL

6764 (20 MIN) 10% SS, CLR TO OFF WH/ CRM, V F GRAIN, ANG TO SUB
ANG, P CMTD, FRI, EST 8% Ø, FREQ CLY FL, 50%
EXHIBIT LT BRN STAIN, SPOTTY TO HOMOGENEOUS YEL GN
FLOR, FAIR STRMG YEL GN CUT...THE UPPER TIGHT
PORTION OF THE BAR

6771 (40 MIN) 40% SS, CLR TO OFF WH/ TAN, TR BDD MICA FLKS, V F
TO F GRAIN, ANG TO SUB ANG, P TO FR CMTD, MOD FRI,
EST 10 TO 12% Ø, OCC QTZ OVGTH, 90% EXHIBIT MED BRN
STAIN, SPOTTY TO HOMOGENEOUS BRIGHT YEL GN FLOR,
INSTANT STRMG YEL GN CUT...GOOD SHOW AND POROSITY
SEEMS ADEQUATE

6776 (60 MIN) 40% SS, CLR TO OFF WH/ TAN, V F TO F GR, ANG TO SUB
ANG, P TO FR CMTD, MOD FRI, EST 10% Ø, BCMG SLI CLY
FL, WDSPRD BRN STAIN, HOMOGENEOUS BRIGHT YEL GR
FLOR, INSTANT STRMG YEL GN CUT...GOOD SHOW...
POROSITY HAS DECREASED SOMEWHAT

6782 (6790) SH, DK TO V DK GY, OCC BLK, SFT TO FRM, PLTY; DEC
SS, GEN A/A, PRED F GR, SUB ANG, P TO FR CMTD, MOD
FRI, 10 TO 12% Ø MAX, SOME CLY FL, GOOD SHOW A/A...
PRESUM CAVINGS, DRILL RATE SUGGESTS SHALE

- 6792 (6800) SH, DK TO V DK GY, OCC BLK, FRM, PLTY TO IRREG;
STILL GETTING 20% SS, A/A...DEFINITELY CAVINGS
- 6800 (6810) SAME
- 6807 (6820) SH, DK TO V DK GY, OCC BLK, FRM, PLTY TO IRREG, OCC
MIC MICA; TR SS A/A PERSISTING
- 6818 (6830) SH, V DK GY TO BLK, FRM, PLTY TO IRREG, OCC MIC
MICA; 10% SS, CLR TO TAN, V F TO F GR, SUB ANG TO
SUB RD, FR CMTD, EST 10% Ø, CLY FL IN PART, WDSPRD
TAN STAIN, SPOTTY TO HOMOGENEOUS YEL GN FLOR, FR
STRMG YEL GN CUT...PRESUM D SS CAVINGS, DRILL RATE
AND CORRELATION SUGGEST SHALE
- 6833 (6840) SH, DK TO V DK GY, OCC BLK, FRM, PLTY TO SUB BLKY,
TR PYR
- NOTE: TRIPPED F/ HOLE IN THE PIPE @ 6848
- L.A.T. (6850) SH, GEN A/A, BCMG SLTY
- THE J SILT INTERVAL
- L.A.T. (6860) SLTST, MED TO DK GY, HD, TITE, SUB BLKY
- 6849 (6865) SLTST, A/A
- THE J SANDSTONE INTERVAL
- 6860 (6870) 5% SS, CLR TO OFF WH, UPPER F TO MED GR, SUB ANG TO
SUB RD, FR TO W CMTD, MAX 10% Ø, WDSPRD QTZ OVGTH,
DIRTY APPEARANCE, QUEST HONEY COLOR STAIN, NO VIS
FLOR, NO CUT UNDER SOLVENT...VERY POOR SAMPLE
RECOVERY
- - THE VERY SLOW DRILLING INTERVAL - -
- 6872 (6880) 25% SS, CLR TO OFF WH/ GY BRN, UPPER F GR, SUB RD,
FR CMTD, SLI CMT, SOME MOD FRI, EST 10 TO 12% Ø
MAX, WDSPRD QTZ OVGTH, OCC CLY FL, OCC V DK BRN TO
BLK TAR LIKE STAIN, TR W/ V DULL YEL PATCHY FLOR,
WEAK MLKY YEL CUT...CUT DOES NOT STREAM...VERY POOR
SHOW
- 6876 (6890) 10% SS CLR TO OFF WH/ WH, V F TO UPPER F GR, P STD,
SUB RD TO SUB ANG, P TO FR CMTD, INC FRI, PRED P
VIS Ø (MAX 10%), OCC V DK BRN TO BLK STAIN A/A, NO
VIS FLOR, NO CUT UNDER SOLVENT

NOTE: SAMPLE RECOVERY HAS DETERIORATED CONSIDERABLY

6878 (6900) 10% SS, CLR TO OFF WH/ WH, GEN A/A, BCMG V FRI,
ABNT LOOSE GRS, EST 12% Ø, CLY FL, SCAT LOOSE CLY
FLKS, NO VIS STAIN, NO FLOR, NO CUT

6882 (6910) SAME

- - THE FAST DRILLING BREAK INTERVAL - -

6890 (6920) 25% SS, CLR TO WH/ OFF WH, "UNCONSOLIDATED", UPPER
F TO MED GRAIN, SUB RD, PRESUM G Ø, APPEARS WET, NO
SHOW

6908 (6930) SS, CLR TO WH, APPEARS WET, UPPER F TO MED GR, PRED
UNCONSOL, V FRI, EST 14 TO 16% Ø, MOSTLY CLEAN, NO
SHOWS

6920 (6940) SS, CLR TO WH, SLI S & P, F GRAIN, SUB ANG, FR
CMTD, EST 12 TO 14% Ø MAX, CLY FL, SCAT LOOSE CLY
FLKS, NO SHOW

6930 (6950) SS, CLR TO WH, V SLI S & P, F GR, SUB ANG, FR CMTD,
EST 12% Ø, OCC QTZ OVGTH, CLY FL, NO SHOW

SIDEWALL CORES

- 6779 SS, GY BRN, ONE PROMINENT HORIZONTAL FRAC, NO VIS STAIN, SLIGHT ODOR, BRIGHT YEL FLOR
- 6778 SS, GY BRN, ONE HORIZONTAL PARTIALLY OPEN FRAC, V F TO F GRAIN, FR VIS Ø, POS SHALE CLAST, GOOD HYDROCARBON ODOR, BRIGHT YEL FLOR
- 6772 SS, GY TO GY BR, ONE OPEN HORIZONTAL FRAC, PYR ALONG FRAC, V TITE, Ø PRESUM OBLITERATED BY QTZ OVGTH, TR FLOR ONLY...THE LOW RESISTIVITY STREAK
- 6770.5 SS, GY, V F GRAIN, TT, WDSPRD QTZ OVGTH, PATCHY YEL FLOR
- 6768.5? SS, LOOSE BROKEN UP PIECES, GY BRN, V F GR, W CMTD, PATCHY FLOR